AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A nano-device comprising a p-n hetrojunction structure of a p-type semiconductor thin film and an n-type ZnO-based nanorod epitaxially grown thereon, wherein free space around portions other than tip portions of the ZnO nanorod grown on the semiconductor thin film is filled with an insulating material.

2. (previously presented): The nano-device of claim 1, wherein the p-type semiconductor is made of a material having a band-gap energy ranging from 1.5 to 4.5 eV.

3. (currently amended): The nano-device of claim 2, wherein p-type semiconductor is made of a material selected from the group consisting of GaN, AlN, GaP, GaAs, ZnSe, CdSe, CdS, ZnS, $SrCu_2O_2$, and SiC ~~and Si~~.

4. (previously presented): The nano-device of claim 1, wherein the p-type semiconductor thin film has a thickness ranging from 50 nm to 200 μm.

5. (previously presented): The nono-device of claim 1, wherein the ZnO-based nanorod has a diameter in the range of 5 to 100 nm and a length in the range of 5 nm to 100 μm.

6. (previously presented): The nano-device of claim 1, wherein the ZnO-based nanorod is a ZnO nanorod or a heteromaterial-doped or coated ZnO-nanorod.

7. (previously presented): The nano-device of claim 6, wherein the heteromaterial is selected from the group consisting of Mg, Mn, Cd, Se and mixtures thereof.

8. (previously presented): The nano-device of claim 6, wherein the doped heteromaterial is selected from the group consisting of $Zn_{1-x}Mg_xO$ ($0<x<1$), $Zn_{1-x}Mn_xO$ ($0<x<1$), $Zn_{1-x}Cd_xO$ ($0<x<1$) and $Zn_{1-x}Se_xO$ ($0<x<1$).

9. (previously presented): A process for preparing the nano-device of claim 1, comprising the steps of bringing vapors of a Zn-containing metal organic compound and an O_2-containing compound separately into contact with a p-type semiconductor thin film at a temperature in the range of 400 to 700 ℃ under a pressure in the range of 0.1 to 10 torr to form a ZnO nanorod on the surface of the p-type semiconductor thin film, filling free space around the ZnO nanorod grown on the p-type semiconductor thin film with an insulating material, exposing tip portion of the ZnO nanorod, and forming electrodes on the surfaces of the p-type semiconductor thin film and the nanorod.

10. (canceled).

11. (previously presented): A nano-system or an integrated circuit comprising the nano-device of claim 1.

12. (previously presented): The process of claim 9, wherein the insulating material is a photoresist or polyimide.